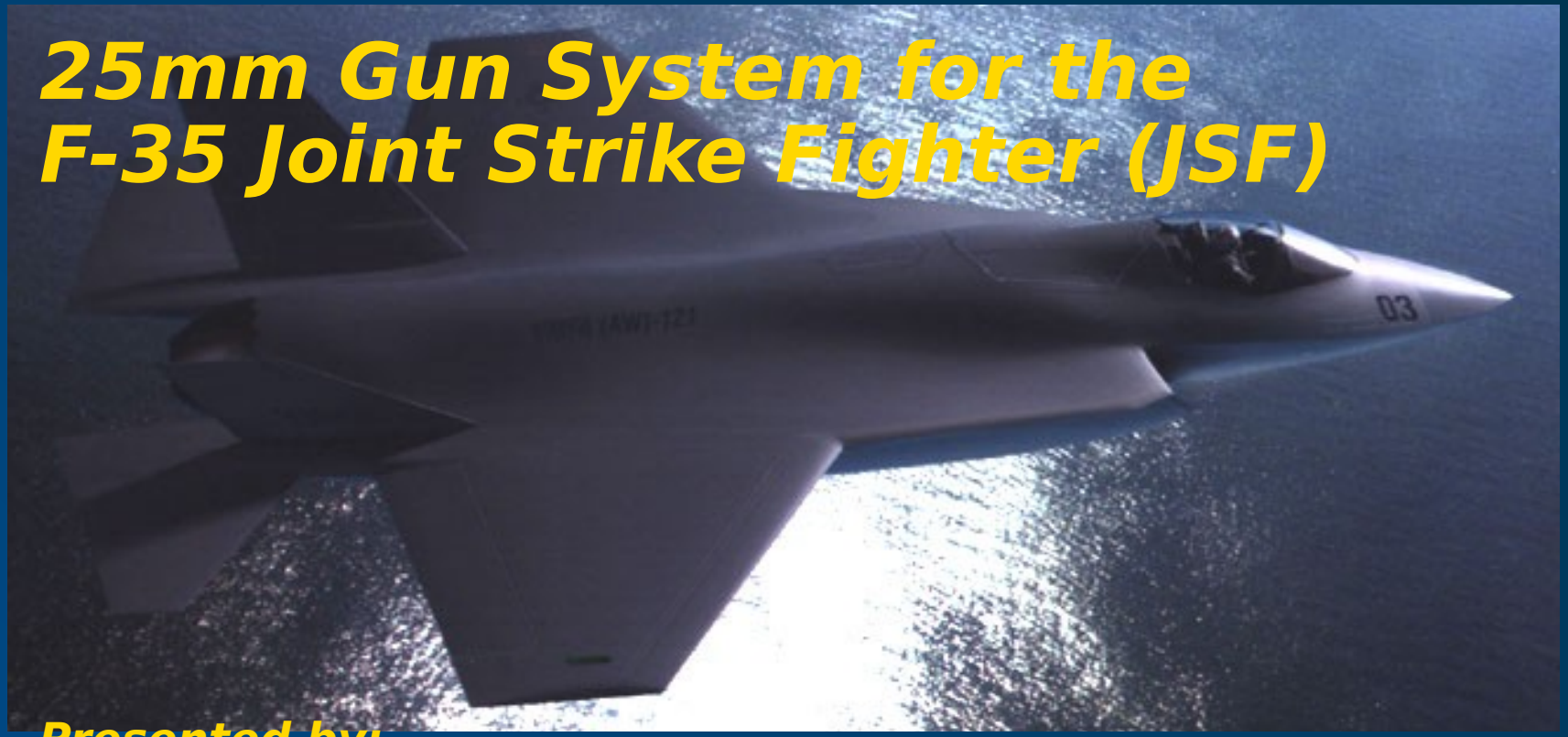
GENERAL DYNAMICS
Armament and Technical Products

25mm Gun System for the F-35 Joint Strike Fighter (JSF)



Presented by:

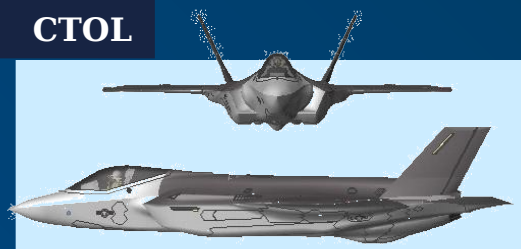
Dave Maher
Project Engineer – Joint Strike Fighter Gun System
General Dynamics Armament & Technical Products
Burlington, Vermont USA

Presentation Outline

- JSF Program Overview
- Key System Requirements
- Technical Approach
  - Internal Gun System (CTOL)
  - Missionized Gun System (CV & STOVL)
- Status
- Path Forward

Lockheed Martin F-35 Variants

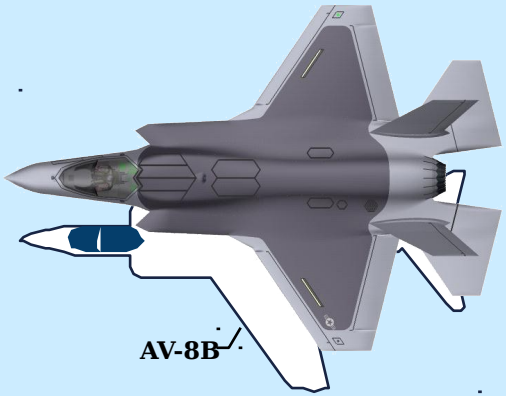
CTOL



Span (ft)	35
Length (ft)	50.5
Wing Area (ft²)	460

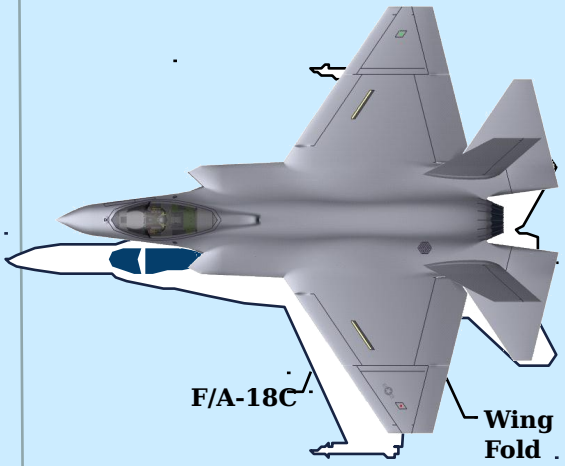
STOVL

Span (ft)	35
Length (ft)	50.5
Wing Area (ft²)	460



CV

Span (ft)	43
Length (ft)	50.8
Wing Area (ft²)	620

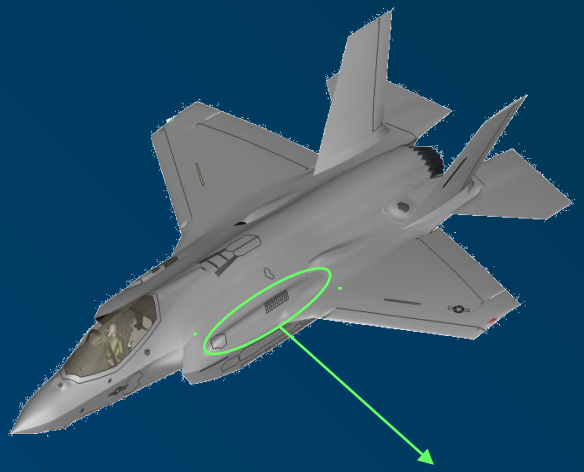


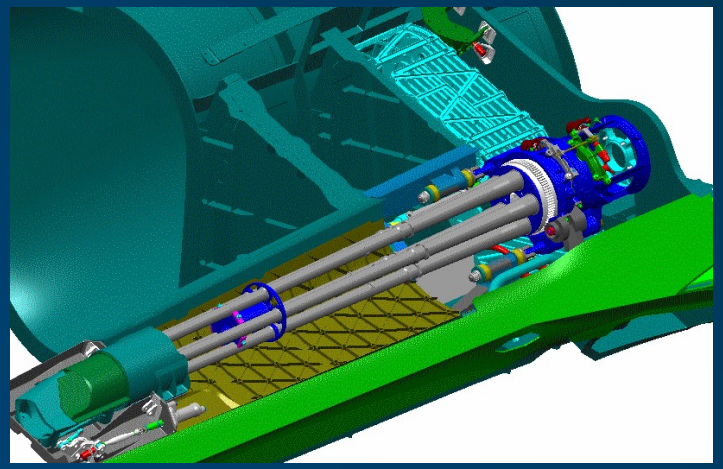
Major Technical Requirements

- 25mm GAU-12 gun firing at 4000 spm
- Compatible with the following ammunition:
  - PGU-23/U Target Practice (TP)
  - PGU-20/U Armor Piercing Incendiary (API)
  - PGU-25/U High Explosive Incendiary (HEI)
- Linkless Ammunition Handling System
  - CTOL: 180 rounds, STOVL/CV: 220 rounds
- GSCU controls gun functions and operation of doors
- Reverse clearing gun
- 2-level maintenance
- Common loader for both system types

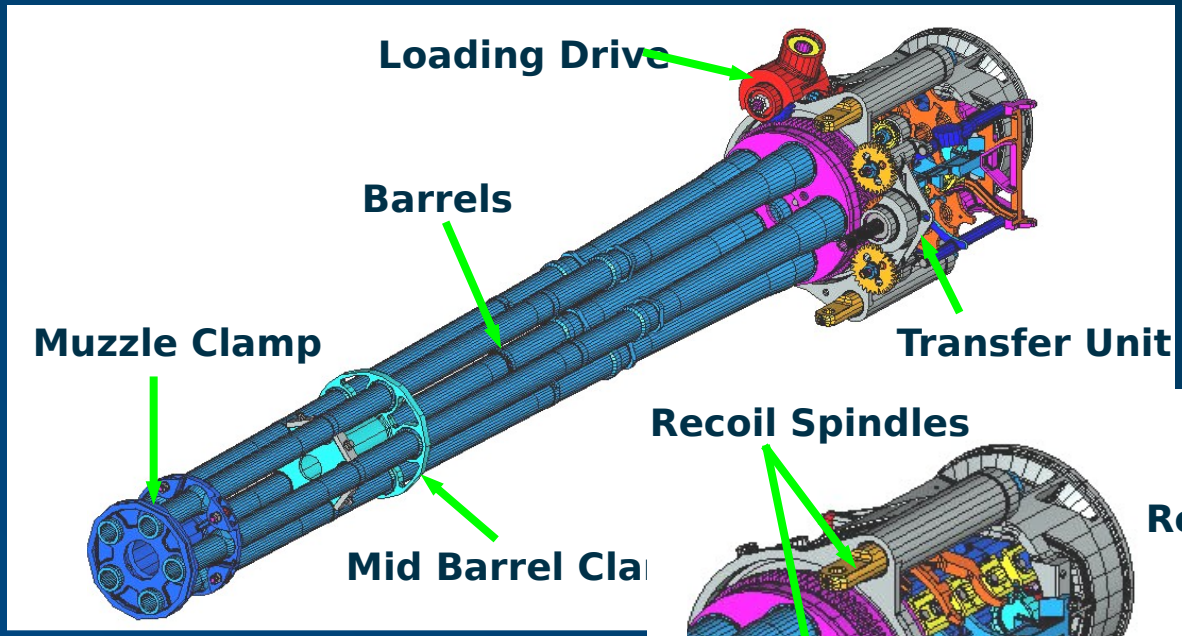
CTOL Gun System

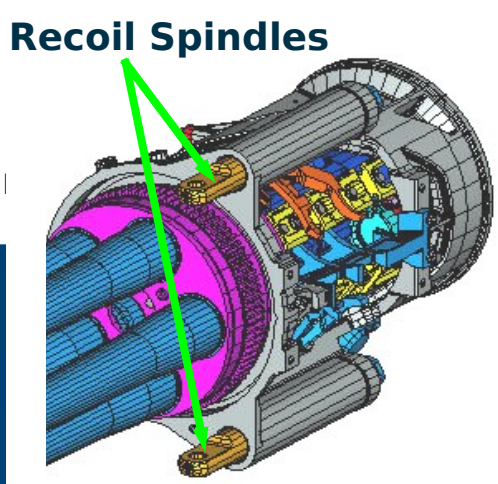
- Ammunition Capacity: 182 rounds
- Modified GAU-12 gun
- Linear linkless AHS, clamshell carrier
- 4000 psi hydraulic drive
- AV-8 style transfer unit, turnaround unit, flex chutes and conveyors
- New GSCU & Loader

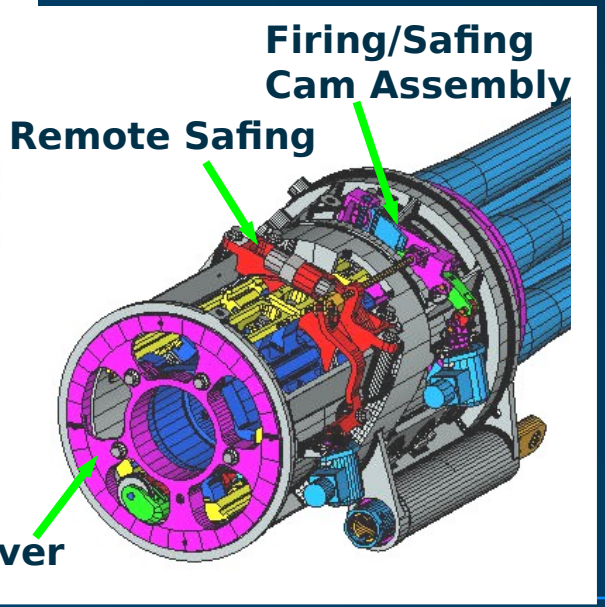




Gun Modifications to GAU-12/U

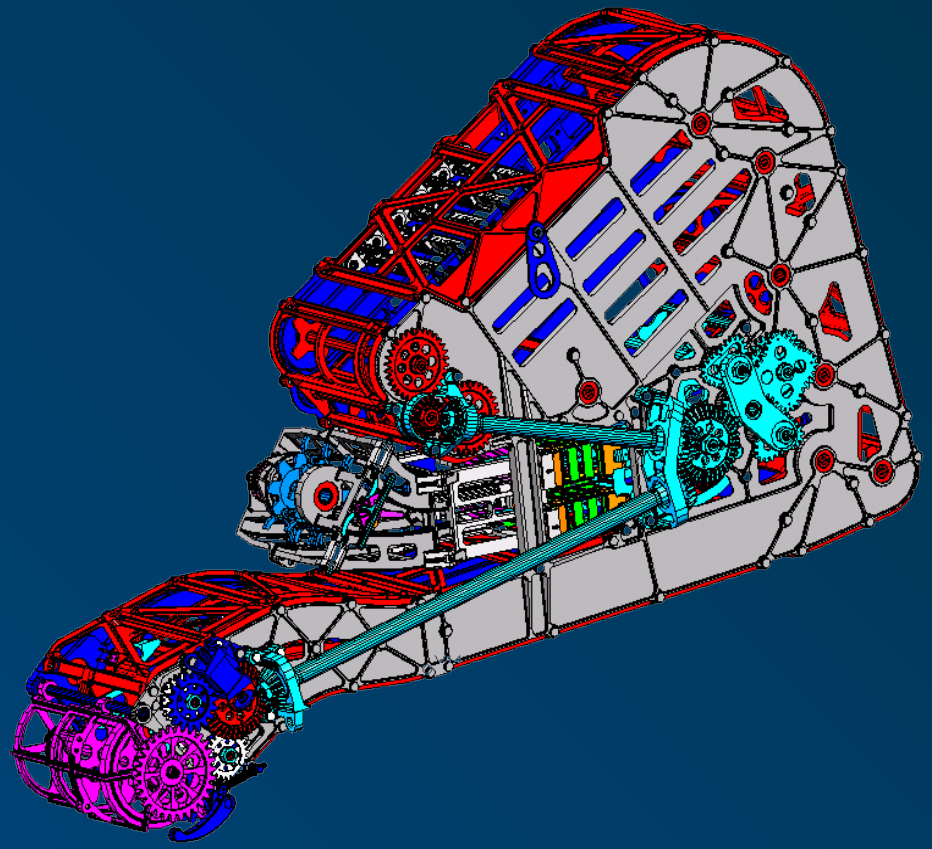






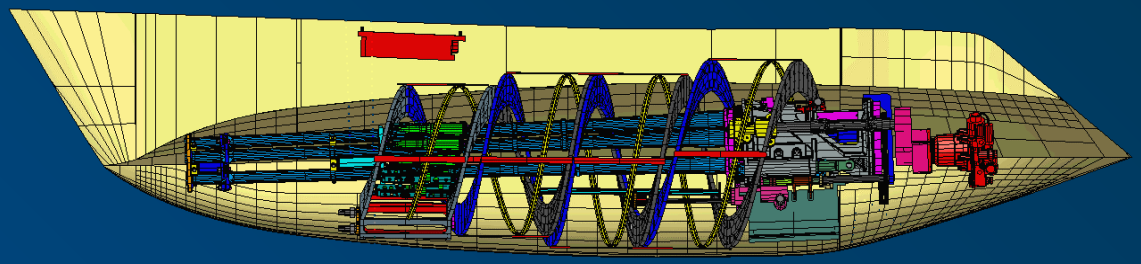
CTOL Gun System
Ammunition Handling System

- Linear Linkless System in Serpentine Arrangement
- Proven Clamshell Conveyor Based on F-15E Design
- Elliptically Geared Handoff Unit
- Positive Round control for High Reliability



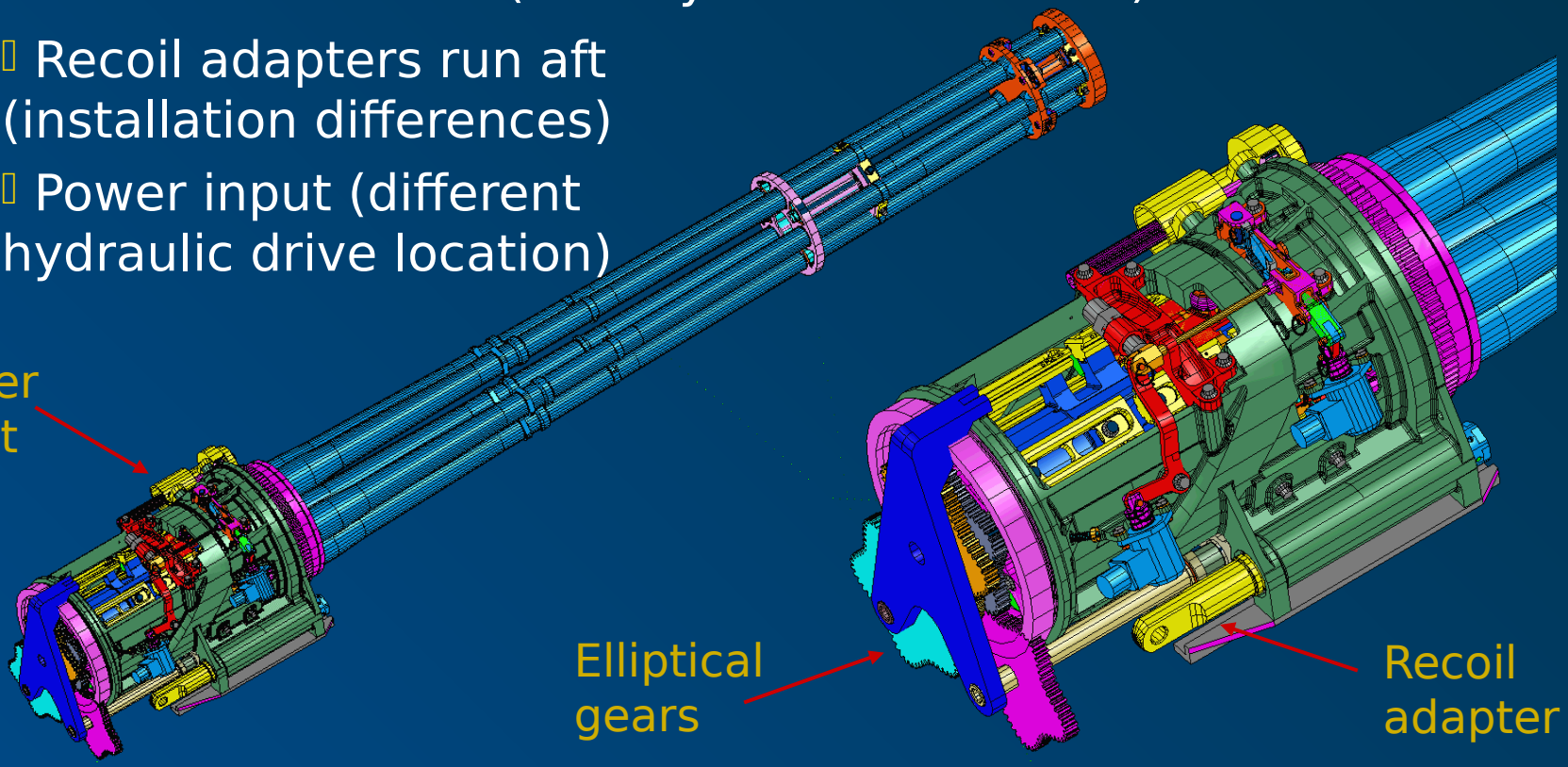
STOVL Gun System

- Ammunition Capacity: 220 rounds
- Common hydraulic drive, GSCU, Loader
- Modified CTOL Gun
- Helical Ammunition Handling System (AHS) similar to GPU-5/A
- Unique transfer unit, turnaround unit



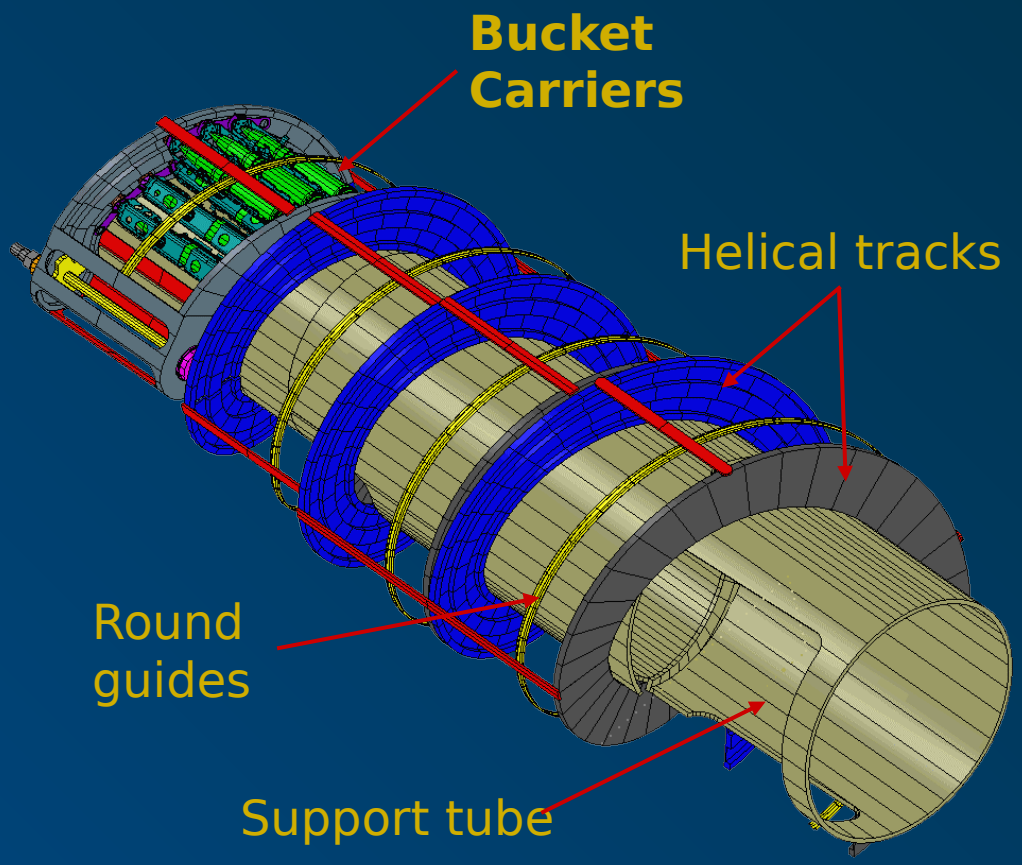
STOVL/CV Gun Modifications

- Identical to CTOL with the following exceptions:
  - New transfer unit (feed system differences)
    - Recoil adapters run aft (installation differences)
    - Power input (different hydraulic drive location)



STOVL Gun System
Ammunition Handling System

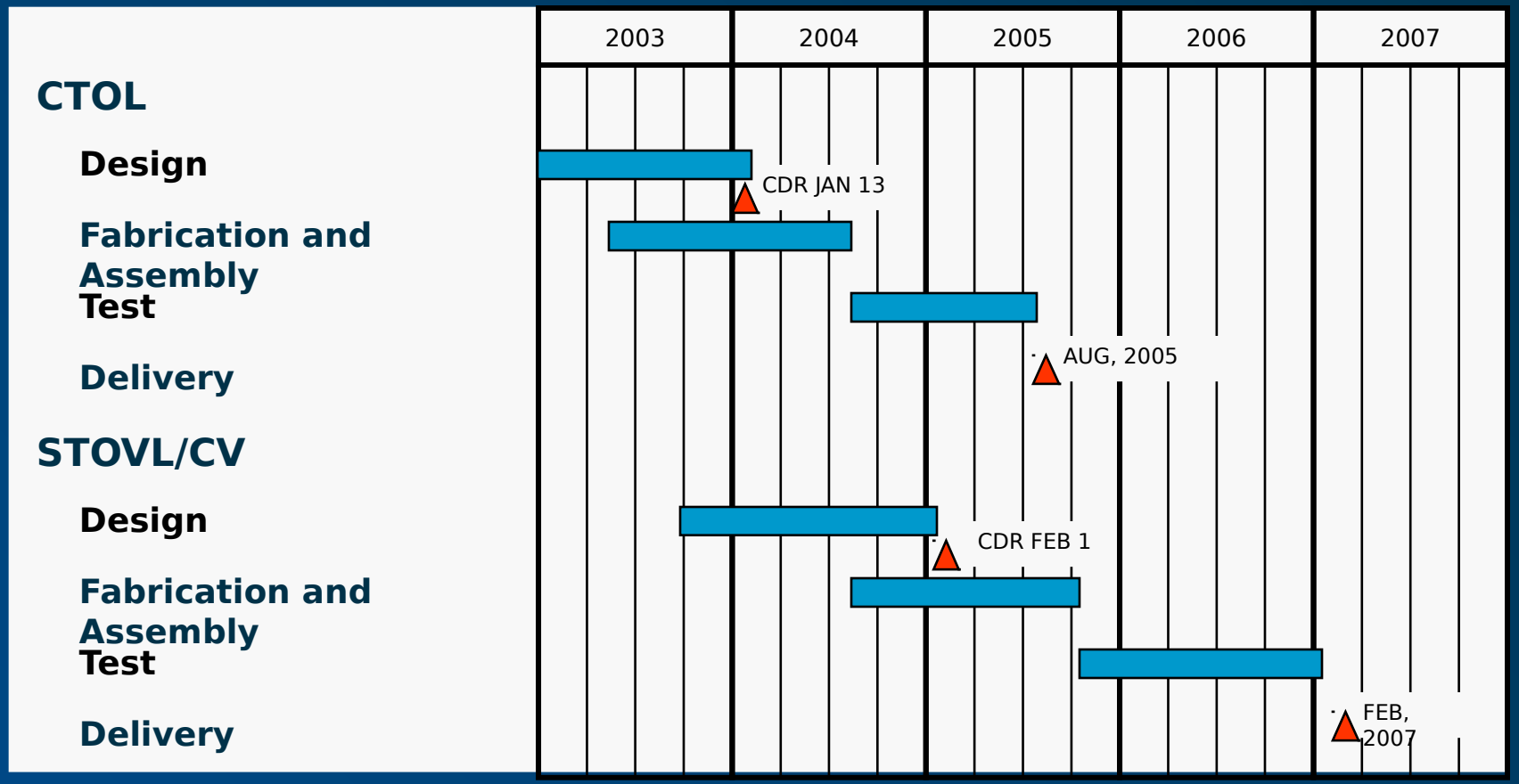
- Linear Linkless System in Helical Arrangement
- Proven Bucket Carrier based on GPU-5/A Design
- Positive Round Control for High Reliability



Challenges

- Short Design Cycle
  - Use AV-8 designs where possible
  - Rapid prototyping for long lead castings
- Aggressive Schedule for Delivery
  - Release CTOL Units 3 & 4 before Engineering test is complete
- Overlap of CTOL and STOVL/CV Schedules

JSF Gun System Master Schedule



Program Status

- Loader QFD ☑
- System Requirements Review ☑
- CTOL Preliminary Design Review ☑
- CTOL Critical Design Review ☑
- All CTOL parts placed on order ☑
- STOVL/CV System Design Review ☑

Path Forward Prior to the 2005 Guns & Ammo Symposium

- Assemble and Debug CTOL SDD Systems 1 & 2
- Complete 10,000 Round Engineering Test on CTOL SDD System 1
- Begin 30,000 Round Qual test on SDD System 1
- Begin Environmental Qual on SDD System 2
- Complete STOVL/CV Critical Design Review